

Haller

Haller Overview

Volunteer monitoring began at Haller Lake in the 1997 and continued through 2004. The data collected suggest that this city lake (Seattle) is moderate in primary productivity (mesotrophic), with good water quality.

Haller Lake has two public access street ends, where boats may be hand launched. Residents should keep a watch on aquatic plants growing nearshore to catch early infestations of Eurasian milfoil, Brazilian elodea, or other noxious weeds.

Physical Parameters

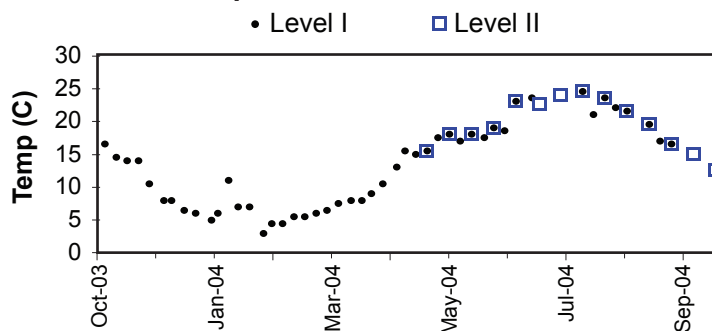
Secchi transparency ranged between 2.0 and 5.0 m through the year. The summer average was 3.2 m, which placed it in the mid range for monitored small lakes in 2004. Annual surface water temperatures ranged between 3.0 and 24.5 degrees Celsius. The recorded maximum was in the lower mid range of values reported among the group.

Excellent precipitation and water level records were compiled during the year. Water levels were broadly consistent with the regional pattern of winter high - autumn low stands, with some sensitivity to large rain events.

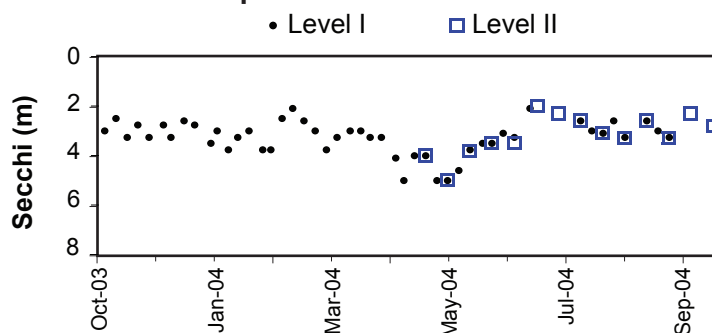
Nutrient Analysis and TSI Ratings

Total phosphorus and total nitrogen remained in relatively constant proportion to each other through the sampling period, with some minor variations. The N:P ratio ranged from 16 to 41, averaging 24 which suggests there might hospitable conditions for nuisance bluegreen growth for part of the time.

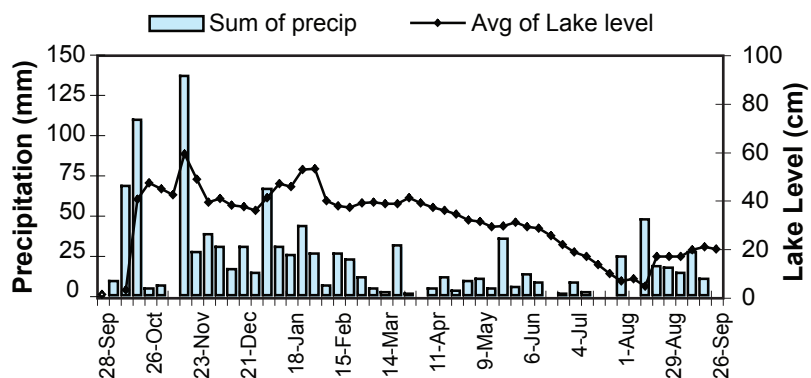
Lake Temperature



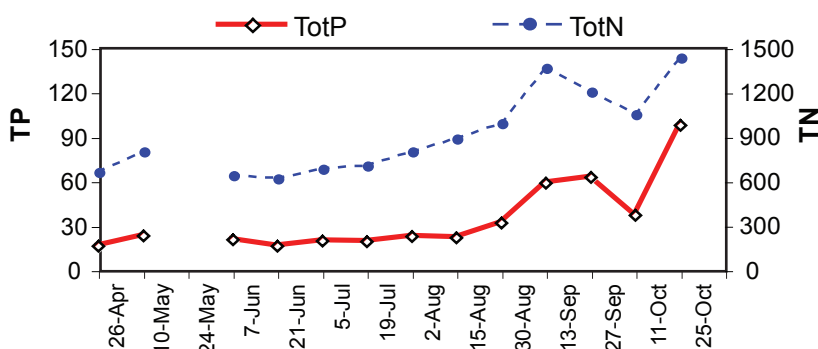
Secchi Depth



Lake Level and Precipitation



Nutrient Analysis



Profile data indicate that thermal stratification was present early in the season and persisted through the summer. The very cool temperatures in the deep water may indicate significant ground water inputs. High concentrations of phosphorus were found in deep water in August, suggesting that anoxia could have triggered a release from the sediments. Chlorophyll data indicated that algae were higher in abundance in the middle of the water column, possibly around the thermocline.

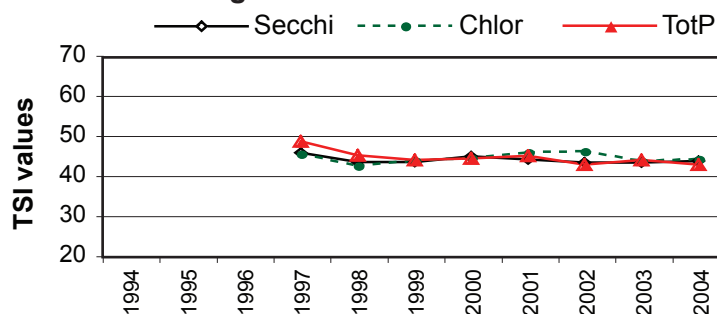
The 2004 TSI indicators were very close to each other, located in the midrange for mesotrophy, similar to most years since monitoring began.

Chlorophyll Concentrations and Algae

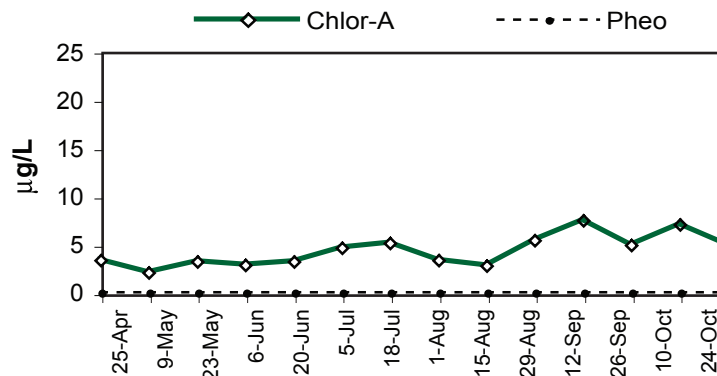
Chlorophyll was relatively constant at 1m through the sample season, rising slowly over time. However, as the profile data suggests, much of the production in the lake may be in deeper water. Algae commonly found included several species of the chrysophyte *Dinobryon*, several species of cryptophytes, the colonial bluegreen *Woronichinia*, and a variety of green algae species.

Date	Secchi	depth-m	degC	Chlor-A	TP µg/L	TN µg/L
5/23/04	3.8	1	18.0	3.20	18.7	332
		6	8.0	7.21	38.0	706
		9	4.0		198.0	1460
8/29/04	3.3	1	21.5	5.50	18.6	313
		6	9.5	12.20	42.1	623
		9	4.5		499.0	3190

TSI Ratings



Chlorophyll a Concentrations (µg/L)



Common Algae

	Group
<i>Dinobryon spp</i>	Chrysophyta
Unidentified single cells	Chrysophyta
<i>Cryptomonas spp.</i>	Cryptophyta

2004 Level I Data

Daily Data Summary

Week of	Sum of precip. (mm)	# of days	Avg of lake level (cm)	# of days
28-Sep-03	0.0	4	0.3	4
5-Oct-03	9.0	7		7
12-Oct-03	68.0	7	2.3	4
19-Oct-03	109.0	7	39.8	0
26-Oct-03	4.0	7	46.6	1
2-Nov-03	6.0	7	44.0	7
9-Nov-03	0.1	7	41.6	7
16-Nov-03	136.0	7	58.4	7
23-Nov-03	27.0	7	48.0	7
30-Nov-03	38.0	7	38.6	7
7-Dec-03	30.0	7	39.9	7
14-Dec-03	16.0	7	37.3	7
21-Dec-03	30.0	7	36.6	7
28-Dec-03	14.0	7	34.9	7
4-Jan-04	66.0	5	40.3	4
11-Jan-04	30.0	7	46.1	7
18-Jan-04	25.0	7	45.1	7
25-Jan-04	43.0	7	52.0	7
1-Feb-04	26.0	7	52.3	7
8-Feb-04	6.0	7	39.1	7
15-Feb-04	26.0	6	36.9	7
22-Feb-04	22.0	7	36.4	7
29-Feb-04	11.0	7	38.1	7
7-Mar-04	4.0	7	38.6	7
14-Mar-04	2.0	7	38.0	7
21-Mar-04	31.0	7	37.9	7
28-Mar-04	1.0	7	40.4	7
4-Apr-04	0.0	7	38.1	7
11-Apr-04	4.0	7	36.3	7
18-Apr-04	11.0	7	35.1	7
25-Apr-04	3.0	7	33.5	7
2-May-04	9.0	7	31.1	7
9-May-04	10.0	7	30.4	7
16-May-04	4.0	7	28.3	7
23-May-04	35.0	7	28.6	7
30-May-04	5.0	7	30.2	7
6-Jun-04	13.0	7	28.4	7
13-Jun-04	8.0	7	27.8	7
20-Jun-04	0.0	7	24.5	7
27-Jun-04	1.0	7	20.8	7
4-Jul-04	8.0	7	17.8	7
11-Jul-04	2.0	7	16.1	7
18-Jul-04	0.0	7	12.6	7
25-Jul-04	0.0	7	8.9	7
1-Aug-04	24.0	7	5.7	7
8-Aug-04	0.0	7	6.9	7
15-Aug-04	47.0	7	3.6	7
22-Aug-04	18.0	7	15.9	7
29-Aug-04	17.0	7	16.1	7
5-Sep-04	14.0	7	15.9	7
12-Sep-04	27.0	7	18.6	7
19-Sep-04	10.0	7	19.9	7
26-Sep-04	0.0	5	19.1	5
Min	0.0		0.3	
Max	136.0		58.4	
Total	1050.1			

Weekly Data Summary

Sample date	Sample time	Secchi (m)	Temp (°C)	Algae* (Shore)	Algae* (at site)	Goose Count*
5-Oct-03	14:30	3.0	16.5	P2	P2	
12-Oct-03	10:30	2.5	14.5	P1	P1	
19-Oct-03	11:00	3.3	14.0	P2	P2	
26-Oct-03	15:00	2.8	14.0	P2	P2	
2-Nov-03	12:00	3.3	10.5	P1	P1	
11-Sep-03	11:30	2.8	8.0	P1	P1	
16-Nov-03	14:00	3.3	8.0	P2	P2	
24-Nov-03	11:00	2.6	6.5	P1	P1	
1-Dec-03	15:00	2.8	6.0	P2	P2	
11-Dec-03	14:00	3.5	5.0	P2	P2	1
15-Dec-03	12:00	3.0	6.0	P1	P1	1
22-Dec-03	14:00	3.8	11.0	P1	P1	0
28-Dec-03	10:00	3.3	7.0	P1	P1	
4-Jan-04	13:45	3.0	7.0	P1	P1	
13-Jan-04	13:45	3.8	3.0	P1	P1	
18-Jan-04	11:20	3.8	4.5	P1	P1	
25-Jan-04	11:20	2.5	4.5	P1	P1	
1-Feb-04	13:30	2.1	5.5	P1	P1	
8-Feb-04	11:30	2.6	5.5	P1	P1	
15-Feb-04	13:30	3.0	6.0	P1	P1	
22-Feb-04	14:30	3.8	6.5	P1	P1	
29-Feb-04	14:45	3.3	7.5	P1	P1	
8-Mar-04	13:00	3.0	8.0	n/a	n/a	
15-Mar-04	10:00	3.0	8.0	C1	P1	
21-Mar-04	11:45	3.3	9.0	P1	P1	
28-Mar-04	13:45	3.3	10.5	P1	P1	
6-Apr-04	13:30	4.1	13.0	P1	P1	
11-Apr-04	13:30	5.0	15.5	P1	P1	
18-Apr-04	14:00	4.0	15.0	P1	P1	
25-Apr-04	13:40	4.0	15.5	P1	P1	
2-May-04	14:00	5.0	17.5	P1	P1	
9-May-04	14:00	5.0	18.0	P1	P1	
16-May-04	13:45	4.6	17.0	P1	P1	
23-May-04	14:00	3.8	18.0	P1	P1	
31-May-04	12:20	3.5	17.5	P1	P1	
6-Jun-04	15:00	3.5	19.0	P1	P1	
13-Jun-04	12:10	3.1	18.5	P1	P1	
20-Jun-04	14:45	3.3	23.0	P1	P1	
30-Jun-04	11:45	2.1	23.5	P1	P1	
1-Aug-04	13:45	2.6	24.5	P1	P1	
8-Aug-04	11:45	3.0	21.0	P1	P1	
15-Aug-04	12:00	3.1	23.5	P1	P1	
22-Aug-04	13:45	2.6	22.0	P2	P2	
29-Aug-04	14:30	3.3	21.5	P1	P1	
12-Sep-04	14:45	2.6	19.5	P1	P1	
19-Sep-04	14:45	3.0	17.0	P1	P1	
26-Sep-04	15:00	3.3	16.5	P1	P1	
Min		2.1	3.0			
Max		5.0	24.5			

* See introduction for discussion of algae assessment and goose count methods.

2004 Level II Data

Date (2004)	Temp (°C)	Secchi (m)	Chl-a (µg/l)	TP (µg/l)	TN (µg/l)	Algae Obsv.	N:P	Calculated TSI		
								Secc	chl-a	TP
25-Apr	15.5	4.0	3.36	19.8	403	1	20	40.0	42.5	47.2
9-May	18.0	5.0	2.08	13.5	311	1	23	36.8	37.8	41.7
23-May	18.0	3.8	3.20	18.7	332	1	18	40.7	42.0	46.4
6-Jun	19.0	3.5	2.88	11.9	304	1	26	41.9	40.9	39.9
20-Jun	23.0	3.5	3.20	8.2	338	1	41	41.9	42.0	34.5
5-Jul	22.5	2.0	4.65	18.6	405	1	22	50.0	45.6	46.3
18-Jul	24.0	2.3	5.13	20.7	403	1	19	48.0	46.6	47.9
1-Aug	24.5	2.6	3.36	12.3	314	1	26	46.2	42.5	40.4
15-Aug	23.5	3.1	2.80	8.75	342	1	39	43.7	40.7	35.4
29-Aug	21.5	3.3	5.45	18.6	313	1	17	42.8	47.2	46.3
12-Sep	19.5	2.6	7.53	14.6	313	1	21	46.2	50.4	42.8
26-Sep	16.5	3.3	4.92	10.0	346	1	35	42.8	46.2	37.4
10-Oct	15.0	2.3	7.05	18.1	359	1	20	48.0	49.7	45.9
24-Oct	12.5	2.8	4.91	23.1	376		16	45.1	46.2	49.4
	Temp (°C)	Secchi (m)	Chl-a (µg/l)	TP (µg/l)	TN (µg/l)	Algae	N:P	Calculated TSI		
								Secc	chl-a	TP
Mean	19.5	3.2	4.3	15.5	347.0	1.0	24	43.9	44.3	43.0
Median	19.3	3.2	4.0	16.4	339.8	1	22	43.2	44.1	44.4
Min	12.5	2.0	2.1	8.2	304.0	1	16	36.8	37.8	34.5
Max	24.5	5.0	7.5	23.1	405.0	1	41	50.0	50.4	49.4
Count	14	14	14	14	14	13	14	14	14	14

TSI Average = 43.7